Attorney Docket No. 0023-0157

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	) **Mail Stop Appeal Brief - Patents**
	)
Ken KUWABARA et al.	) Group Art Unit: 2419
	)
Application No.: 09/990,204	) Examiner: A. Lee
	)
Filed: November 21, 2001	)
	)
For: FILTER-BASED FORWARDING IN A NETWORK	)

APPEAL BRIEF

U.S. Patent and Trademark Office
Customer Window, Mail Stop Appeal Brief - Patents
Randolph Building
401 Dulany Street
Alexandria, Virginia 22314

Sir:

This Appeal Brief is submitted in response to the final Office Action mailed January 6, 2009 and in support of the Notice of Appeal filed June 5, 2009.

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I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Juniper Networks, Inc.

II. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals, interferences or judicial proceedings.

III. STATUS OF CLAIMS

Claims 10-12 and 17-33 are pending in this application. Claims 1-9 and 13-16 were previously canceled without prejudice or disclaimer. Claims 10-12 and 17-33 are rejected and are the subject of the present appeal. Claims 10-12 and 17-33 are reproduced in the Claim Appendix of this Appeal Brief.

IV. STATUS OF AMENDMENTS

No Amendment has been filed subsequent to the final Office Action mailed January 6, 2009. A Request for Reconsideration, however, was filed April 6, 2009. A subsequent Advisory Action, mailed May 21, 2009, indicated that the Request for Reconsideration has been considered.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

In the paragraphs that follow, a concise explanation of the independent claims, each dependent claim argued separately, and the claims reciting means-plus-function or step-plus-function language that are involved in this appeal will be provided by referring, in parenthesis, to examples of where support can be found in the specification and drawings.

Claim 10 recites: A method of configuring a networking device, comprising: generating a first forwarding table (e.g., 310, Fig. 3; page 8, lines 17-23); generating a second forwarding table (e.g., 310, Fig. 3; page 8, lines 17-23); programming a filter to perform a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions (e.g., 330, Fig. 3; 440, Fig. 4; page 7, line 21 – page 8, line 6; page 8, lines 17-23; page 9, lines 10-17); programming the filter to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions (e.g., 330, Fig. 3; 440, Fig. 4; page 7, line 21 – page 8, line 6; page 8, lines 17-23; page 9, lines 10-17).

Claim 17 recites: A networking device comprising: a memory for storing a first forwarding table (e.g., 220(A), Fig. 2; page 7, lines 6-10) and a second forwarding table (e.g., 220(B), Fig. 2; page 7, lines 6-10); a filter (e.g., 200, Fig. 2) programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions (e.g., page 7, lines 11-20; page 9, lines 10-17).

Claim 21 recites: In a router containing a plurality of forwarding tables, a method of packet forwarding, comprising: receiving a packet at an ingress interface (e.g., page 9, lines 1-9); classifying the received packet based on at least a first field value contained in the header of the packet (e.g., 410, Fig. 4; page 9, lines 1-9); associating one of the plurality of forwarding tables to the packet according to its classification (e.g., 420, Fig. 4; page 9, lines 1-9); performing a lookup operation in the associated forwarding table according to at least a second field value contained in the header of the packet (e.g., 440, Fig. 4; page 9, lines 10-17); determining an egress interface based on the lookup operation (e.g., 440, Fig. 4; page 9, lines 10-17); and transmitting the received packet from the determined egress interface (e.g., page 9, lines 10-17) .

Claim 23 recites: The method of claim 22, where the classifying further comprises assigning a default classification if none of the criteria are met (e.g., page 9, lines 1-9).

Claim 26 recites: In a networking device, a method of forwarding packets, comprising: classifying a received packet based on information contained in the packet (e.g., 410, Fig. 4; page 9, lines 1-9); selecting one of a plurality of forwarding tables based on the classification of the received packet (e.g., 420, Fig. 4; page 9, lines 1-9); performing a lookup operation using the selected forwarding table (e.g., page 9, lines 10-17); and determining an egress interface for the packet based on the performed lookup operation (e.g., 440, Fig. 4; page 9, lines 10-17).

Claim 27 recites: A method of configuring a networking device, comprising: generating a first forwarding table including information identifying a first plurality of egress interface ports (e.g., 310, Fig. 3; page 8, lines 7-11 and 17-23); generating a second forwarding table including information identifying a second plurality of egress

interface ports (e.g., 310, Fig. 3; page 8, lines 7-11 and 17-23); programming a filter to initiate a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions (e.g., page 9, lines 10-17); programming the filter to initiate a lookup operation in the second forwarding table if a first field value meets one or more conditions of a second set of conditions (e.g., page 9, lines 10-17).

Claim 30 recites: A networking device comprising: a memory for storing a first forwarding table (e.g., 220(A), Fig. 2) and a second forwarding table (e.g., 220(B), Fig. 2), the first forwarding table and the second forwarding table including information identifying a plurality of egress interfaces (e.g., page 8, lines 7-11); and a filter (e.g., 200, Fig. 2) programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets one or more conditions of a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value meets one or more conditions of a second set of conditions (e.g., page 7, lines 11-20 and page 9, lines 10-17).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. Claims 21- 26 are rejected under 35 U.S.C. § 102(e) as being anticipated by AGGARWAL et al. (U.S. Patent Application No. 6,330,614 B1).

B. Claims 10-12, 17-20, and 27-33 are rejected under 35 U.S.C. § 103(a) as being unpatentable over ANDERSSON et al. (U.S. Patent No. 7,023,846 B1) in view of HARIGUCHI et al. (U.S. Patent No. 6,956,858 B2).

VII. ARGUMENTS

A. Claims 21-26 are rejected under 35 U.S.C. § 102(e) as being anticipated by AGGARWAL et al.

The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention always rests upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). A proper rejection under 35 U.S.C. § 102 requires that a single reference teach every aspect of the claimed invention. Any feature not directly taught must be inherently present. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 2 U.S.P.Q.2d 1051 (Fed. Cir. 1987).

1. Claims 21, 22, and 24

Independent claim 21 recites, in a router containing a plurality of forwarding tables, a method of packet forwarding that includes receiving a packet at an ingress interface; classifying the received packet based on at least a first field value contained in the header of the packet; associating one of the plurality of forwarding tables to the packet according to its classification; performing a lookup operation in the associated forwarding table according to at least a second field value contained in the header of the packet; determining an egress interface based on the lookup operation; and transmitting the received packet from the determined egress interface. AGGARWAL et al. does not disclose or suggest one or more of these features.

For example, AGGARWAL et al. does not disclose or suggest classifying a received packet based on at least a first field value contained in a header of the packet and associating one of a plurality of forwarding tables to the packet according to its classification. The Examiner relies on column 5, lines 1-8 of AGGARWAL et al. as

allegedly disclosing these features of claim 21 (final Office Action, pg. 15). Appellants respectfully disagree with the Examiner's interpretation of AGGARWAL et al.

At column 5, lines 1-8, AGGARWAL et al. discloses:

> …examining the destination network address in the header, it knows which one of the local interfaces to which to forward the datagram. Using these two tables, the Routing Table and the Forwarding Table, later more fully discussed, a datagram that enters the network can thus be forwarded to the eventual destination by examining the datagram header and looking up the Forwarding Table to find the next interface to which to send the datagram.

This section of AGGARWAL et al. discloses that a datagram that enters a network can be forwarded to an eventual destination by examining the datagram header and looking up the Forwarding Table to find the next interface to which to send the datagram. AGGARWAL et al. further discloses that each router creates a Forwarding table that maps a destination network address to one of its interfaces (column 4, lines 63-65). Therefore, AGGARWAL et al. discloses that a router looks up a next interface using the router's Forwarding Table. AGGARWAL et al. does not disclose <u>associating one of a plurality of forwarding tables to the packet according to its classification</u>. Rather, AGGARWAL et al. discloses using a header to look up a forwarding destination in a single Forwarding Table. Therefore, AGGARWAL et al. does not disclose or suggest classifying a received packet based on at least a first field value contained in a header of the packet and associating one of a plurality of forwarding tables to the packet according to its classification, as recited in claim 21.

In response to similar arguments made in a previous response, the Examiner states that the Examiner "interpreted associating one of a plurality of forwarding tables to the packet according to its classification as Using these two tables, the Routing Table and the Forwarding Table, later more fully discussed, a datagram that enters the network can thus

be forwarded to the eventual destination by examining the datagram header and looking up the Forwarding Table to find the next interface to which to send the datagram" and relies on column 5, lines 1-8 and 42-52 of AGGARWAL et al. for support (Advisory Action, pg. 2). Appellants respectfully disagree.

As noted above, at column 5, lines 1-8, AGGARWAL et al. discloses that a datagram that enters a network can be forwarded to an eventual destination by examining the datagram header and <u>looking up the Forwarding Table to find the next interface to which to send the datagram</u>. AGGARWAL et al. further discloses that each router creates a Forwarding Table, from a Routing Table, that maps a destination network address to one of its interfaces (column 4, lines 63-65). Therefore, AGGARWAL et al. discloses that a router looks up a next interface using the router's Forwarding Table. AGGARWAL et al. does not disclose <u>associating one of a plurality of forwarding tables to the packet according to its classification</u>. Rather, AGGARWAL et al. discloses using a header to look up a forwarding destination <u>in a single Forwarding Table</u>. Therefore, AGGARWAL et al. does not disclose or suggest classifying a received packet based on at least a first field value contained in a header of the packet and associating one of a plurality of forwarding tables to the packet according to its classification, as recited in claim 21.

At column 5, lines 42-52, AGGARWAL et al. discloses that an egress interface of a datagram is determined based on the incoming Destination Address in the incoming IP datagram. Once a header is verified, data is either sent to another port in the networking node or to a Routing Engine within the networking node. As noted above, the egress interface is determined by looking up the Forwarding Table to find the next interface to

which to send the datagram. As further noted above, AGGARWAL et al. discloses using a header to look up a forwarding destination in a single Forwarding Table. Therefore, AGGARWAL et al. does not disclose or suggest classifying a received packet based on at least a first field value contained in a header of the packet and associating one of a plurality of forwarding tables to the packet according to its classification, as recited in claim 21.

For at least the foregoing reasons, Appellants submit that the rejection of claim 21 under 35 U.S.C. § 102(e) based on AGGARWAL et al. is improper. Accordingly, Appellants request that the rejection of claim 21 be reversed.

Claims 22 and 24 depend from claim 21. Therefore, Appellants request the rejection of these claims be reversed for at least the reasons given above with respect to claim 21.

2. Claim 23

Claim 23 depends from claim 22. Therefore, Appellants request that the rejection of claim 23 be reversed for at least the reasons given above with respect to claim 22. Moreover, claim 23 recites an additional feature not disclosed or suggested by AGGARWAL et al.

For example, claim 23 recites that the classifying further comprises assigning a default classification if none of the criteria are met. The Examiner relies on column 6, lines 11-25 of AGGARWAL et al. as allegedly disclosing this feature of claim 23 (final Office Action, pg. 16). Appellants respectfully disagree with the Examiner's interpretation of AGGARWAL et al.

At column 6, lines 11-25, AGGARWAL et al. discloses:

> In this simple example, the Routing Engine sees multiple exit or output ports, labeled as Output Ports 1-4, for destination network addresses a and c. The Routing Engine will decide, based on one of many options, such as cost, hop count, etc., the best exit port to reach destination network address \`a\` and destination network address \`c\`. Assuming for this example that the Routing Engine chooses the interface to port 1 for the forwarding of all datagrams destined for network address \`a\`, and it chooses port 2 for the forwarding of all datagrams destined for network address \`c\`, based on this information, the Routing Engine will thereupon create the Forwarding Table shown in Table 1, below. Each network address, a to j, is listed within parenthesis as four numbers which represents the real network address as four bytes.

This section of AGGARWAL et al. discloses creating a forwarding table based on the output ports for destination network addresses. This section of AGGARWAL et al. deals with determining the best exit port to reach a destination network address and has nothing to do with assigning a default classification if no criteria are met. In fact, this section of AGGARWAL et al. has nothing to do with a default classification at all. Therefore, this section of AGGARWAL et al. does not disclose or suggest that the classifying further comprises assigning a default classification if none of the criteria are met, as recited in claim 23.

For at least this additional reason, Appellants submit that the rejection of claim 23 under 35 U.S.C. § 102(e) based on AGGARWAL et al. is improper. Accordingly, Appellants request that the rejection of claim 23 be reversed.

3. <u>Claim 26</u>

Independent claim 26 recites classifying a received packet based on information contained in the packet; selecting one of a plurality of forwarding tables based on the classification of the received packet; performing a lookup operation using the selected forwarding table; and determining an egress interface for the packet based on the performed lookup operation. AGGARWAL et al. does not disclose or suggest one or more of these features.

For example, AGGARWAL et al. does not disclose or suggest classifying a received packet based on information contained in the packet, and selecting one of a plurality of forwarding tables based on the classification of the received packet. The Examiner relies on column 5, lines 1-8 of AGGARWAL et al. as allegedly disclosing these features of claim 26 (final Office Action, pg. 16). Appellants respectfully disagree with the Examiner's interpretation of AGGARWAL et al.

As noted above, at column 5, lines 1-8, AGGARWAL et al. discloses that a datagram that enters a network can be forwarded to an eventual destination by examining the datagram header and looking up the Forwarding Table to find the next interface to which to send the datagram. AGGARWAL et al. further discloses that each router creates a Forwarding table that maps a destination network address to one of its interfaces (column 4, lines 63-65). Therefore, AGGARWAL et al. discloses that a router looks up a next interface using the router's Forwarding Table. AGGARWAL et al. does not disclose <u>selecting one of a plurality of forwarding tables based on a classification of a received packet</u>. Rather, AGGARWAL et al. discloses using a header to look up a forwarding destination <u>in a single Forwarding Table</u>. Therefore, AGGARWAL et al. does not disclose or suggest classifying a received packet based on information contained in the packet, and selecting one of a plurality of forwarding tables based on the classification of the received packet, as recited in claim 26.

For at least this additional reason, Appellants submit that the rejection of claim 26 under 35 U.S.C. § 102(e) based on AGGARWAL et al. is improper. Accordingly, Appellants request that the rejection of claim 26 be reversed.

B. Claims 10-12, 17-20, and 27-33 are rejected under 35 U.S.C. § 103(a) as being

unpatentable over ANDERSSON et al. in view of HARIGUCHI et al.

The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention always rests upon the Examiner. In re Oetiker, 977 F.2d 1443, 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). In rejecting a claim under 35 U.S.C. § 103, the Examiner must provide a factual basis to support the conclusion of obviousness. In re Warner, 379 F.2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967). Based upon the objective evidence of record, the Examiner is required to make the factual inquiries mandated by Graham v. John Deere Co., 86 S. Ct. 684, 383 U.S. 1, 148 U.S.P.Q. 459 (1966). KSR International Co. v. Teleflex Inc., 550 U.S. 398, 127 S. Ct. 1727 (2007). The Examiner is also required to explain how and why one having ordinary skill in the art would have been realistically motivated to modify an applied reference and/or combine applied references to arrive at the claimed invention. Uniroyal, Inc. v. Rudkin-Wiley Corp., 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988).

1. Claims 10-12

Independent claim 10 is directed to a method of configuring a networking device. The method includes generating a first forwarding table; generating a second forwarding table; programming a filter to perform a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions; and programming the filter to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions. ANDERSSON et al. and HARIGUCHI et al., whether taken alone or in any reasonable combination, do not disclose or suggest this combination of features.

For example, ANDERSSON et al. and HARIGUCHI et al. do not disclose or

suggest programming a filter to perform a lookup operation in a first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions and programming the filter to initiate a lookup operation in a second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 10. The Examiner admits that ANDERSSON et al. does not disclose these features (final Office Action, pg. 3). To remedy this deficiency, the Examiner relies on the abstract, Figs. 3 and 36, column 2, lines 16-44, and column 5, lines 43-54 of HARIGUCHI et al. for allegedly disclosing the above features of claim 10 (final Office Action, pp. 3-4). Appellants note that there are there is no Fig. 36 in the HARIGUCHI et al. document. Appellants further disagree with the Examiner's interpretation of HARIGUCHI et al.

In the abstract, HARIGUCH et al. discloses:

> A routing table circuit for a router has one or more input ports and output ports for message communication. In the routing table circuit, one or more routing table memories store a plurality of routing table arrays. The routing table arrays are arranged hierarchically in levels, and each routing table array is associated with a predetermined subset of prefixes. Each routing table array has entries. The entries include a block default route pointer field to store a block default route pointer, if any, and a routing field. The route engine may access any level of table array by using a next level route pointer stored in the routing field. Using the block default route and the routing field, the present invention further reduces the number of memory accesses and the update cost for route insertion and deletion by identifying and skipping elements that do not require route updating.

This section of HARIGUCHI et al. discloses that, using a block default route and a routing field, a number of memory accesses and the update cost for route insertion and deletion into a routing table may be reduced by identifying and skipping elements that do not require route updating. This section of HARIGUCHI et al. does not disclose that the routing table is used to search for a route when a first value of a received packet meets one or more conditions of a first set of conditions. In fact, this section of HARIGUCHI

et al. does not disclose or suggest a set of conditions at all. Therefore, this section of HARIGUCHI et al. does not disclose or suggest programming a filter to perform a lookup operation in a first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions and programming the filter to initiate a lookup operation in a second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 10.

In Fig. 3, HARIGUCHI et al. illustrates a router that uses a routing table to search for a route corresponding to a destination address in a fixed, deterministic, amount of time (column 7, lines 39-41). HARIGUCHI et al. does not disclose that the routing table is used to search for a route when a first value of a received packet meets one or more conditions of a first set of conditions. In fact, Fig. 3 of HARIGUCHI et al. does not disclose or suggest a set of conditions at all. Therefore, Fig. 3 of HARIGUCHI et al. does not disclose or suggest programming a filter to perform a lookup operation in a first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions and programming the filter to initiate a lookup operation in a second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 10.

At column 2, lines 16-44, HARIGUCHI et al. discloses:

> To determine a route, one prior art routing table architecture uses a hash table. In hash-based routing tables, two tables and one special route entry are typically used. The first table, rt_host, is used for host routes and stores IP host addresses and output ports. The second table, rt_net, is used for network routes and stores IP network addresses and their route information. The special route entry specifies a default route. When a packet is being routed, the router searches the first table, rt_host, for host routes, if any. The router performs the search by comparing the destination address to the IP host addresses in the routing table. When no IP host address in the first table matches the destination address, the first table does not specify the host route and the search fails. When the search of the first table fails to find a host route, the router searches the second table,

> rt_net, to determine a network route, if any, using the destination address and the IP network addresses stored in the second table. When no IP network address in the second table matches the destination address, the second table does not specify the network route and the search fails. When the search of the second table fails to find a network route, the router uses the default route, if specified.
>
> The first and second tables, rt_host and rt_net, respectively, are usually implemented as hash tables. For the first table, rt_host, routers use the entire destination IP host address in the incoming packet as a hash key to determine a starting pointer to a linked list in the first table. A linear search is performed through the linked list to determine whether the destination IP host address matches any entry in the linked list. If so, this matching entry, which has the host route, is returned.

This section of HARIGUCHI et al. discloses that, when a packet is routed, the router searches the first table for host routes, if any. When no IP host address in the first table matches the destination address of the packet, the router searches a second table to determine a network route, if any, using the destination address and the IP network addresses stored in the second table. HARIGUCHI et al. discloses automatically searching in the first table. In other words, HARIGUCHI et al. discloses performing a lookup operation in a first table regardless of whether a field of a packet meets one or more conditions of a first set of conditions. Therefore, this section of HARIGUCHI et al. does not disclose or suggest programming a filter to perform a lookup operation in a first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions and programming the filter to initiate a lookup operation in a second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 10.

At column 5, lines 43-54, HARIGUCHI et al. discloses:

> One embodiment of the invention provides a routing table circuit that comprises a route engine and one or more routing table memories storing a plurality of routing table arrays. The routing table arrays are arranged hierarchically in a plurality of levels, and each routing table array is associated with a predetermined subset of prefixes of the IP address. Each routing table has a plurality of entries. The entries include a block default route pointer field to store

> a block default route pointer, if any, and a routing field. The routing field may store a route pointer or a next level pointer to one of the routing tables in another level. A route engine selects the block default route pointer or the route pointer as a return route pointer based on the destination address.

This section of HARIGUCHI et al. discloses a plurality of routing table arrays arranged hierarchically in a plurality of levels, where each routing table array is associated with a predetermined subset of prefixes of the IP address. A level zero array is associated with the first sixteen bits of the destination address; a level one array is associated with the next eight bits of the destination address; and a level two array is associated with the last eight bits of the destination address (column 9, lines 11-29). When searching for a route in the array, an index into the level 0 array is generated based on the first sixteen bits of the destination address. The routing field stores a pointer to the level 1 array. Based on the pointer to the level 1 array and a subset of bits associated with the destination address, the level 1 array is accessed (column 14, lines 18-32). Therefore, HARIGUCHI et al. discloses that the level zero array is first accessed and then subsequent arrays may be accessed based on the routing fields of the level zero array. As such, assuming the level zero array of HARIGUCHI et al. can be construed as corresponding to the first forwarding table of claim 10 (a point that Appellants do not concede), HARIGUCHI et al. does not disclose or suggest programming a filter to perform a lookup operation in the level zero array <u>if a first field value of a received packet meets one or more conditions of a first set of conditions</u>, as would be required by HARIGUCHI et al. based on the Examiner's interpretation of claim 10. Rather, as noted above, HARIGUCHI et al. discloses that a lookup operation is first performed in the level zero array. Therefore, HARIGUCHI et al. does not disclose or suggest programming a filter to perform a lookup operation in a first forwarding table if a first field value of a received packet

meets one or more conditions of a first set of conditions and programming the filter to initiate a lookup operation in a second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 10.

In response to similar arguments made in a previous response, the Examiner alleges that HARIGUCH et al. discloses the above feature of claim 10 by disclosing that "the route engine may access any level of table array by using a next level route pointer stored in the routing field', 'when a packet is being routed, the router searches the first table, rt_host, for host routes,…the first table, rt_host, routers use the entire destination IP address in the incoming packet as a hash key to determine a starting pointer…'" (final Office Action, pg. 19). Appellants respectfully disagree with the Examiner's allegation.

As noted above, HARIGUCHI et al. discloses that, when a packet is routed, the router searches the first table for host routes, if any. When no IP host address in the first table matches the destination address of the packet, the router searches a second table to determine a network route, if any, using the destination address and the IP network addresses stored in the second table. HARIGUCHI et al. discloses automatically searching in the first table. In other words, HARIGUCHI et al. discloses performing a lookup operation in a first table regardless of whether a field of a packet meets one or more conditions of a first set of conditions. Therefore, this section of HARIGUCHI et al. does not disclose or suggest programming a filter to perform a lookup operation in a first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions and programming the filter to initiate a lookup operation in a second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 10.

For at least the foregoing reasons, Appellants submit that the rejection of claim 10 under 35 U.S.C. § 103(a) based on ANDERSSON et al. and HARIGUCHI et al. is improper. Accordingly, Appellants request that the rejection of claim 10 be reversed.

Claims 11 and 12 depend from claim 10. Therefore, Appellants request that the rejection of claims 11 and 12 be reversed for at least the reasons given above with respect to claim 10.

2. Claims 17-20

Independent claim 17 recites a networking device that includes a memory for storing a first forwarding table and a second forwarding table; and a filter programmed to initiate a lookup operation in the first forwarding table if a first field header contained in a received packet meets a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions. ANDERSSON et al. and HARIGUCHI et al., whether taken alone or in any reasonable combination, do not disclose or suggest one or more of these features.

For example, ANDERSSON et al. and HARIGUCH et al. do not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field header contained in a received packet meets a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions. The Examiner admits that ANDERSSON et al. does not disclose this feature (final Office Action, pg. 5). To remedy this deficiency, the Examiner relies on the abstract, Figs. 3 and 36, column 2, lines 16-57, and column 5, lines 43-54 of HARIGUCHI et al. for allegedly disclosing the

above features of claim 17 (final Office Action, pg. 6). Appellants note that there are there is no Fig. 36 in the HARIGUCHI et al. document. Appellants further disagree with the Examiner's interpretation of HARIGUCHI et al.

As noted above, in the abstract, HARIGUCH et al. discloses that, using a block default route and a routing field, a number of memory accesses and the update cost for route insertion and deletion into a routing table may be reduced by identifying and skipping elements that do not require route updating. This section of HARIGUCHI et al. does not disclose initiating a lookup in the routing table when a first value in a header of a received packet meets a first set of conditions. In fact, this section of HARIGUCHI et al. does not disclose or suggest a set of conditions at all. Therefore, this section of HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field header contained in a received packet meets a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 17.

As noted above, in Fig. 3, HARIGUCHI et al. illustrates a router that uses a routing table to search for a route corresponding to a destination address in a fixed, deterministic, amount of time (column 7, lines 39-41). HARIGUCHI et al. does not disclose that the routing table is used to search for a route when a first value of a header in a received packet meets a first set of conditions. In fact, Fig. 3 of HARIGUCHI et al. does not disclose or suggest a set of conditions at all. Therefore, Fig. 3 of HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field header contained in a received packet meets a first set

of conditions and to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 17.

At column 2, lines 16-57, HARIGUCHI et al. discloses that, when a packet is routed, the router searches the first table for host routes, if any. When no IP host address in the first table matches the destination address of the packet, the router searches a second table to determine a network route, if any, using the destination address and the IP network addresses stored in the second table. HARIGUCHI et al. discloses <u>automatically searching in the first table</u>. In other words, HARIGUCHI et al. discloses performing a lookup operation in a first table <u>regardless of whether a field of a packet meets one or more conditions of a first set of conditions</u>. Therefore, this section of HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field header contained in a received packet meets a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 17.

As noted above, at column 5, lines 43-54, HARIGUCHI et al. discloses a plurality of routing table arrays arranged hierarchically in a plurality of levels, where each routing table array is associated with a predetermined subset of prefixes of the IP address. A level zero array is associated with the first sixteen bits of the destination address; a level one array is associated with the next eight bits of the destination address; and a level two array is associated with the last eight bits of the destination address (column 9, lines 11-29). When searching for a route in the array, an index into the level 0 array is generated

based on the first sixteen bits of the destination address. The routing field stores a pointer to the level 1 array. Based on the pointer to the level 1 array and a subset of bits associated with the destination address, the level 1 array is accessed (column 14, lines 18-32). Therefore, HARIGUCHI et al. discloses that the level zero array is first accessed and then subsequent arrays may be accessed based on the routing fields of the level zero array. As such, assuming the level zero array of HARIGUCHI et al. can be construed as corresponding to the first forwarding table of claim 17 (a point with which Appellants do not agree), HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the level zero array if a first field value of a header contained in a received packet meets a first set of conditions, as would be required by HARIGUCHI et al. based on the Examiner's interpretation of claim 17. Rather, as noted above, HARIGUCHI et al. discloses that a lookup operation is first performed in the level zero array. Therefore, HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field header contained in a received packet meets a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions, as recited in claim 17.

For at least the foregoing reasons, Appellants submit that the rejection of claim 17 under 35 U.S.C. § 103(a) based on ANDERSSON et al. and HARIGUCHI et al. is improper. Accordingly, Appellants request that the rejection of claim 17 be reversed.

Claims 18-20 depend from claim 17. Therefore, Appellants request that the rejection of claims 18-20 be reversed for at least the reasons given above with respect to claim 17.

3. Claims 27-29

Independent claim 27 recites a method of configuring a network device. The method includes generating a first forwarding table including information identifying a first plurality of egress interface ports; generating a second forwarding table including information identifying a second plurality of egress interface ports; programming a filter to initiate a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions; and programming the filter to initiate a lookup operation in the second forwarding table if a first field value meets one or more conditions of a second set of conditions. ANDERSSON et al. and HARIGUCHI et al., whether taken alone or in any reasonable combination, do not disclose or suggest one or more of these features.

For example, ANDERSSON et al. and HARIGUCHI et al. do not disclose or suggest programming a filter to initiate a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions, and programming the filter to initiate a lookup operation in the second forwarding table if a first field value meets one or more conditions of a second set of conditions. The Examiner admits that ANDERSSON et al. does not disclose this feature (final Office Action, pg. 9). To remedy this deficiency, the Examiner relies on the abstract, Figs. 3 and 36, column 2, lines 16-57, and column 5, lines 43-54 of HARIGUCHI et al. for allegedly disclosing the above features of claim 27 (final Office Action, pg. 10). Appellants note that there are there is no Fig. 36 in the HARIGUCHI et al. document. Appellants further disagree with the Examiner's interpretation of HARIGUCHI et al.

As noted above, in the abstract, HARIGUCH et al. discloses that, using a block default route and a routing field, a number of memory accesses and the update cost for route insertion and deletion into a routing table may be reduced by identifying and skipping elements that do not require route updating. This section of HARIGUCHI et al. does not disclose programming a filter to initiate a lookup in the routing table when a first value of a received packet meets one or more conditions of a first set of conditions. In fact, this section of HARIGUCHI et al. does not disclose or suggest a set of conditions at all. Therefore, this section of HARIGUCHI et al. does not disclose or suggest programming a filter to initiate a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions, and programming the filter to initiate a lookup operation in the second forwarding table if a first field value meets one or more conditions of a second set of conditions, as recited in claim 27.

As noted above, in Fig. 3, HARIGUCHI et al. illustrates a router that uses a routing table to search for a route corresponding to a destination address in a fixed, deterministic, amount of time (column 7, lines 39-41). HARIGUCHI et al. does not disclose that the routing table is used to search for a route when a first field value of a received packet meets one or more conditions of a first set of conditions. In fact, Fig. 3 of HARIGUCHI et al. does not disclose or suggest a set of conditions at all. Therefore, Fig. 3 of HARIGUCHI et al. does not disclose or suggest programming a filter to initiate a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions, and programming the filter to initiate a lookup operation in the second forwarding table if a first field value meets one

or more conditions of a second set of conditions, as recited in claim 27.

At column 2, lines 16-57, HARIGUCHI et al. discloses that, when a packet is routed, the router searches the first table for host routes, if any. When no IP host address in the first table matches the destination address of the packet, the router searches a second table to determine a network route, if any, using the destination address and the IP network addresses stored in the second table. HARIGUCHI et al. discloses automatically searching in the first table. In other words, HARIGUCHI et al. discloses performing a lookup operation in a first table regardless of whether a field of a packet meets one or more conditions of a first set of conditions. Therefore, this section of HARIGUCHI et al. does not disclose or suggest programming a filter to initiate a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions, and programming the filter to initiate a lookup operation in the second forwarding table if a first field value meets one or more conditions of a second set of conditions, as recited in claim 27.

As noted above, at column 5, lines 43-54, HARIGUCHI et al. discloses a plurality of routing table arrays arranged hierarchically in a plurality of levels, where each routing table array is associated with a predetermined subset of prefixes of the IP address. A level zero array is associated with the first sixteen bits of the destination address; a level one array is associated with the next eight bits of the destination address; and a level two array is associated with the last eight bits of the destination address (column 9, lines 11-29). When searching for a route in the array, an index into the level 0 array is generated based on the first sixteen bits of the destination address. The routing field stores a pointer to the level 1 array. Based on the pointer to the level 1 array and a subset of bits

associated with the destination address, the level 1 array is accessed (column 14, lines 18-32). Therefore, HARIGUCHI et al. discloses that the level zero array is first accessed and then subsequent arrays may be accessed based on the routing fields of the level zero array. As such, assuming the level zero array of HARIGUCHI et al. can be construed as corresponding to the first forwarding table of claim 27 (a point with which Appellants do not agree), HARIGUCHI et al. does not disclose or suggest programming a filter to initiate a lookup operation in the level zero array <u>if a first field value of a received packet meets one or more conditions of a first set of conditions</u>, as would be required by HARIGUCHI et al. based on the Examiner's interpretation of claim 27. Rather, as noted above, HARIGUCHI et al. discloses that a lookup operation is first performed in the level zero array. Therefore, HARIGUCHI et al. does not disclose or suggest programming a filter to initiate a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions, and programming the filter to initiate a lookup operation in the second forwarding table if a first field value meets one or more conditions of a second set of conditions, as recited in claim 27.

For at least the foregoing reasons, Appellants submit that the rejection of claim 27 under 35 U.S.C. § 103(a) based on ANDERSSON et al. and HARIGUCHI et al. is improper. Accordingly, Appellants request that the rejection of claim 27 be reversed.

Claims 28 and 29 depend from claim 27. Therefore, Appellants request that the rejection of claims 28 and 29 be reversed for at least the reasons given above with respect to claim 27.

4. <u>Claims 30-33</u>

Independent claim 30 recites a networking device that includes a memory for storing a first forwarding table and a second forwarding table, the first forwarding table and the second forwarding table including information identifying a plurality of egress interfaces; and a filter programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets one or more conditions of a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value meets one or more conditions of a second set of conditions. ANDERSSON et al. and HARIGUCHI, whether taken alone or in any reasonable combination, do not disclose or suggest one or more of the features of claim 30.

For example, ANDERSSON et al. and HARIGUCHI et al. do not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets one or more conditions of a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value meets one or more conditions of a second set of conditions. The Examiner admits that ANDERSSON et al. does not disclose this feature (final Office Action, pg. 12). To remedy this deficiency, the Examiner relies on the abstract, Figs. 3 and 36, column 2, lines 16-57, and column 5, lines 43-54 of HARIGUCHI et al. for allegedly disclosing the above features of claim 30 (final Office Action, pg. 13). Appellants note that there are there is no Fig. 36 in the HARIGUCHI et al. document. Appellants further disagree with the Examiner's interpretation of HARIGUCHI et al.

As noted above, in the abstract, HARIGUCH et al. discloses that, using a block default route and a routing field, a number of memory accesses and the update cost for

route insertion and deletion into a routing table may be reduced by identifying and skipping elements that do not require route updating. This section of HARIGUCHI et al. does not disclose initiating a lookup in routing table when a first value in a header of a received packet meets one or more conditions of a first set of conditions. In fact, this section of HARIGUCHI et al. does not disclose or suggest a set of conditions at all. Therefore, this section of HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets one or more conditions of a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value meets one or more conditions of a second set of conditions, as recited in claim 30.

As noted above, in Fig. 3, HARIGUCHI et al. illustrates a router that uses a routing table to search for a route corresponding to a destination address in a fixed, deterministic, amount of time (column 7, lines 39-41). HARIGUCHI et al. does not disclose that the routing table is used to search for a route when a first value of a header in a received packet meets one or more conditions of a first set of conditions. In fact, Fig. 3 of HARIGUCHI et al. does not disclose or suggest a set of conditions at all. Therefore, Fig. 3 of HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets one or more conditions of a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value meets one or more conditions of a second set of conditions, as recited in claim 30.

At column 2, lines 16-57, HARIGUCHI et al. discloses that, when a packet is

routed, the router searches the first table for host routes, if any. When no IP host address in the first table matches the destination address of the packet, the router searches a second table to determine a network route, if any, using the destination address and the IP network addresses stored in the second table. HARIGUCHI et al. discloses <u>automatically searching in the first table</u>. In other words, HARIGUCHI et al. discloses performing a lookup operation in a first table <u>regardless of whether a field of a packet meets one or more conditions of a first set of conditions</u>. Therefore, this section of HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets one or more conditions of a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value meets one or more conditions of a second set of conditions, as recited in claim 30.

As noted above, at column 5, lines 43-54, HARIGUCHI et al. discloses a plurality of routing table arrays arranged hierarchically in a plurality of levels, where each routing table array is associated with a predetermined subset of prefixes of the IP address. A level zero array is associated with the first sixteen bits of the destination address; a level one array is associated with the next eight bits of the destination address; and a level two array is associated with the last eight bits of the destination address (column 9, lines 11-29). When searching for a route in the array, an index into the level 0 array is generated based on the first sixteen bits of the destination address. The routing field stores a pointer to the level 1 array. Based on the pointer to the level 1 array and a subset of bits associated with the destination address, the level 1 array is accessed (column 14, lines 18-32). Therefore, HARIGUCHI et al. discloses that the level zero array is first accessed

and then subsequent arrays may be accessed based on the routing fields of the level zero array. As such, assuming the level zero array of HARIGUCHI et al. can be construed as corresponding to the first forwarding table of claim 30 (a point with which Appellants do not agree), HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the level zero array <u>if a first field value of a header contained in a received packet meets one or more conditions of a first set of conditions</u>, as would be required by HARIGUCHI et al. based on the Examiner's interpretation of claim 30. Rather, as noted above, HARIGUCHI et al. discloses that a lookup operation is first performed in the level zero array. Therefore, HARIGUCHI et al. does not disclose or suggest a filter programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets one or more conditions of a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value meets one or more conditions of a second set of conditions, as recited in claim 30.

For at least the foregoing reasons, Appellants submit that the rejection of claim 30 under 35 U.S.C. § 103(a) based on ANDERSSON et al. and HARIGUCHI et al. is improper. Accordingly, Appellants request that the rejection of claim 30 be reversed.

Claims 31-33 depend from claim 30. Therefore, Appellants request that the rejection of claims 31-33 be reversed for at least the reasons given above with respect to claim 30.

VIII. CONCLUSION

In view of the foregoing arguments, Appellants respectfully solicit the Honorable Board to reverse the Examiner's rejections of claims 10-12 and 17-33.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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IX. CLAIM APPENDIX

1-9. (canceled)

10. A method of configuring a networking device, comprising:

generating a first forwarding table;

generating a second forwarding table;

programming a filter to perform a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions;

programming the filter to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions.

11. The method of claim 10, where the generating a first forwarding table comprises generating a first forwarding table containing an entry corresponding to a first label switched path.

12. The method of claim 11, where the generating a second forwarding table comprises generating a second forwarding table containing an entry corresponding to a second label switched path.

13 - 16. (canceled)

17. A networking device comprising:

a memory for storing a first forwarding table and a second forwarding table;

a filter programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value does not meet one or more conditions of the first set of conditions.

18. The networking device of claim 17, where the first forwarding table contains an entry corresponding to a first label switched path.

19. The networking device of claim 18, where_the second forwarding table contains an entry corresponding to a second label switched path.

20. The networking device of claim 17, further comprising:

a plurality of ingress interfaces for receiving packets;

a plurality of egress interfaces for transmitting packets,

where each of the lookup operations results in an identification of an egress interface from which the received packet is to be transmitted.

21. In a router containing a plurality of forwarding tables, a method of packet forwarding, comprising:

receiving a packet at an ingress interface;

classifying the received packet based on at least a first field value contained in the header of the packet;

associating one of the plurality of forwarding tables to the packet according to its classification;

performing a lookup operation in the associated forwarding table according to at least a second field value contained in the header of the packet;

determining an egress interface based on the lookup operation; and

transmitting the received packet from the determined egress interface.

22. The method of claim 21, where the classifying comprises determining whether the first field value meets one or more criteria.

23. The method of claim 22, where the classifying further comprises assigning a default classification if none of the criteria are met.

24. The method of claim 21, where a first forwarding table contains an entry corresponding to a first label switched path.

25. The method of claim 24, where the first forwarding table contains an entry corresponding to a second label switched path.

26. In a networking device, a method of forwarding packets, comprising:

classifying a received packet based on information contained in the

packet;

selecting one of a plurality of forwarding tables based on the classification of the received packet;

performing a lookup operation using the selected forwarding table; and

determining an egress interface for the packet based on the performed lookup operation.

27. A method of configuring a networking device, comprising:

generating a first forwarding table including information identifying a first plurality of egress interface ports;

generating a second forwarding table including information identifying a second plurality of egress interface ports;

programming a filter to initiate a lookup operation in the first forwarding table if a first field value of a received packet meets one or more conditions of a first set of conditions;

programming the filter to initiate a lookup operation in the second forwarding table if a first field value meets one or more conditions of a second set of conditions.

28. The method of claim 27, where generating a first forwarding table comprises generating a first forwarding table containing an entry corresponding to a first label switched path.

29. The method of clam 28, where generating a second forwarding table comprises generating a second forwarding table containing an entry corresponding to a second label switched path.

30. A networking device comprising:

a memory for storing a first forwarding table and a second forwarding table, the first forwarding table and the second forwarding table including information identifying a plurality of egress interfaces; and

a filter programmed to initiate a lookup operation in the first forwarding table if a first field value of a header contained in a received packet meets one or more conditions of a first set of conditions and to initiate a lookup operation in the second forwarding table if the first field value meets one or more conditions of a second set of conditions.

31. The networking device of claim 30, where the first forwarding table contains an entry corresponding to a first label switched path.

32. The networking device of claim 31, where the second forwarding table contains an entry corresponding to a second label switched path.

33. The networking device of claim 30, further comprising:

a plurality of ingress interfaces for receiving packets;

the plurality of egress interfaces for transmitting packets,

wherein each of the lookup operations results in an identification of an egress interface from which the received packet is to be transmitted.

X. EVIDENCE APPENDIX

None

XI. RELATED PROCEEDINGS APPENDIX

None